

United States of America

Preliminary Views

Sharing between NGSO FSS and FS in the 10 - 30 GHz Range

1 Introduction

This document presents U.S. Preliminary Views on three topics concerning sharing between Non-GSO FSS and FS in Ku-band and Ka-band:

- 1) PFD Limits for NGSO Satellites in the 10.7-12.75 GHz Band
- 2) PFD Limits for NGSO Satellites in the 17.7-19.3 GHz Band
- 3) Sharing between FS and Non-GSO FSS Earth Stations in the Resolution 130 Bands between 10 and 30 GHz

The results of the January, 1999 JTG 4-9-11 meeting in Long Beach, CA are reflected to show the progress of the work that has occurred to date regarding sharing between FS and Non-GSO FSS in response to WRC-97 Resolutions 130 and 131. Areas where further work may be undertaken by WP 4-9S in April, 1999 are also indicated.

2 PFD Limits in the 10.7-12.75 GHz Band

The output of the January 1999 meeting of JTG 4-9-11 regarding the 11/12 GHz pfd limits are contained in Doc. 4-9-11/TEMP/72 which has been included in the JTG Chairman's Report (Doc. 4-9-11/367) as Annex 2 to Attachment 1. The following reflects the issues discussed:

- The current per-satellite pfd limits are adequate for the protection of the FS in the 10.7-12.75 GHz band, subject to several assumptions including:
 - Number of NGSO systems is in the range 3 to 5
 - Contribution of GSO systems to long term interference is not significant
 - The use of specific FS protection criteria, applied to typical FS links using ATPC features as described in Annex 2 to Attachment 1 of Doc. 4-9-11/367.

Further Work

- By means of a Liaison Statement (Doc. 4-9-11/TEMP/81), the JTG requested that if WP 4-9S had views on PFD limits for Non-GSO FSS at 11/12 GHz, that they be forwarded to the May 1999 JTG 4-9-11 meeting.
- Studies are ongoing in the U.S. on the impact of ATPC on long term interference in the 10.7 – 11.7 GHz band.
- Studies in the ITU thus far have focused on point-to-point FS systems. The U.S. is continuing to study the issue of sharing between the BSS and point-to-multipoint FS systems and between Non-GSO FSS and point-to-multipoint FS systems in the 12.2 – 12.7 GHz band.

3 PFD Limits in the 17.7-19.3 GHz Band

The output of the January 1999 meeting of JTG 4-9-11 regarding the 18 GHz pfd limits are contained in Doc. 4-9-11/TEMP/80 which has been included in the JTG Chairman's Report (Doc. 4-9-11/367) as Annex 3 to Attachment 1. The following reflects the issues discussed:

- The U.S. position has maintained that the original pfd limits (-105/-115) contained in Article S21 of the ITU Radio Regulations are adequate to protect the FS while not unduly constraining the FSS, and that no technical studies have proven a need to tighten these limits.
- However, the limits proposed by Europe and agreed upon at the January 1999 meeting of JTG 4-9-11 reflect a compromise that the U.S. can accept based on the assumptions stated in Annex 3 to Attachment 1 of Doc. 4-9-11/367 (Doc. 4-9-11/TEMP/80).
- This solution adopted by the JTG is a compromise that should be supported in the spirit of international cooperation since it appears that the existing and proposed FSS systems can live with these pfd limits and they provide additional protection to FS systems.

Further Work

- By means of a Liaison Statement (Doc. 4-9-11/TEMP/81), the JTG requested that if WP 4-9S has views on PFD limits for Non-GSO FSS at 18 GHz, that they be forwarded to the May 1999 JTG 4-9-11 meeting.
- At a meeting of the Correspondence Group 9A-Interference (RCG-9A-Interference) which was held concurrently with the JTG meeting in Long Beach, a Liaison Statement was prepared for transmission to WP 3M, and for information to JWP 4-9S. This seeks guidance for determining the long term and short term interference occurrences due to propagation events less than 10 seconds in duration for the 18 GHz band.
- The U.S. has performed further studies to be submitted to WP 4-9S in April, 1999. These studies show further evidence that even the original (-105/-115) pfd limits are sufficient to protect the FS from Non-GSO FSS satellite transmissions. These submissions will be used to

support the compromise pfd limits agreed upon at the JTG 4-9-11 meeting in January, 1999 which afford additional protection to FS receivers.

4 Sharing Between FS Stations and Non-GSO FSS Earth Stations in the Resolution 130 Bands between 10 and 30 GHz

The output of the January 1999 meeting of JTG 4-9-11 regarding the 18 GHz pfd limits are contained in Doc. 4-9-11/TEMP/62 Rev. 2 which has been included in the JTG Chairman's Report (Doc. 4-9-11/367) as Annex 4 to Attachment 1. The following reflects the issues discussed:

- The JTG recognized the difficulty of frequency sharing between FS and NGSO FSS in the same geographic area if either service deploys large numbers of stations.
- Although this is a domestic issue except in the vicinity of international borders, it is desirable to have global harmonization of frequency usage. In particular, many satellite systems require access to the same spectrum on a global basis. FS manufacturers and operators also benefit if their equipment can operate on the same frequencies in every country.
- Where both services deploy large numbers of stations, frequency separation (band segmentation) leads to an effective use of the spectrum. Where neither service deploys in large numbers, sharing through frequency coordination leads to an effective use of the spectrum.
- In principle, the use of mitigation techniques by one or both services improves the ability of those services to share the same frequency bands. The feasibility of potential mitigation techniques and their relative effectiveness are currently being studied. This involves a wide range of technical, economic and regulatory trade-offs. In cases where mitigation is insufficient or not practicable between FS and NGSO FSS in those bands that are heavily used by one service, possible solutions range from frequency separation to constraining the introduction of networks of the other service to low density, non-ubiquitous applications.

Further Work

- Studies of the effects of specific mitigation techniques are required to determine if and how they can best be applied to promote sharing.

Attachments

Annex 2 to Attachment 1 of Doc. 4-9-11/367

Annex 3 to Attachment 1 of Doc. 4-9-11/367

Document 3M/82, 4-9S/102

Document 4-9S/101, 9A/75